Progress Energy

OCT 8 2008

Serial: HNP-08-103
10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: NRC Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
LICENSEE EVENT REPORT 2008-002-00

Ladies and Gentlemen:

The enclosed Licensee Event Report 2008-002-00 is submitted in accordance with 10 CFR 50.73. This report describes a Manual Actuation of the Reactor Protection System due to Main Condenser Exhaust Boot Failure.

This document contains no new Regulatory Commitment. Please refer any questions regarding this submittal to Mr. Dave Corlett, Supervisor - Licensing/Regulatory Programs, at (919) 362-3137.

Sincerely,

Kelvin Henderson
Plant General Manager
Harris Nuclear Plant

KH/adz

Enclosure

cc: Mr. M. E. Pribish, Acting NRC Sr. Resident Inspector, HNP
Ms. M. G. Vaaler, NRC Project Manager, HNP
Mr. L. A. Reyes, NRC Regional Administrator, Region II

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NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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4. TITLE
Manual Actuation of the Reactor Protection System due to Main Condenser Exhaust Boot Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	05000
08	11	2008	2008	- 002 -	00	10	08	2008	FACILITY NAME: N/A	DOCKET NUMBER: 05000

9. OPERATING MODE
1

10. POWER LEVEL
021

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Tony Zimmerman – Licensing Engineer	(919) 362-2326

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	SG	EXJ	Flexonics, Inc.	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On August 10, 2008 the Harris Plant experienced an increase in condenser backpressure and changes in the Steam Generator secondary side chemistry. A decision was made to shut the unit down due to rising condenser backpressure. At approximately 21% power, the unit was manually tripped by operators due to reaching predetermined administrative limits. The plant promptly attained normal operation no-load temperature and pressure, and no unusual conditions or additional actuations were observed for plant equipment following the reactor and turbine trip. The increase in condenser backpressure was caused by a failure of the condenser exhaust boot seal due to aging.

The root cause of exhaust boot seal failure was that past experience was not applied to the preparation of the preventative maintenance deferral of the condenser exhaust boot. Immediate corrective actions completed include cleaning the boot seal retaining areas and contact surfaces of the trough, and installing new boot seals. Planned corrective actions to prevent reoccurrence include revising the condenser exhaust boot seal replacement frequency based on operating experience and vendor recommendations. This replacement will include requirements to inspect and remove rough edges from mounting hardware and mating surfaces. All preventative maintenance deferrals prepared since June 2005 that deferred Single Point Vulnerability outage maintenance items will be reviewed to ensure technical adequacy. Additionally, plant staff will revise the Nuclear Generation Group procedure governing Preventative Maintenance and Surveillance Testing Administration to provide guidance on Single Point Vulnerability deferrals and identify the appropriate approval levels.

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NARRATIVE

Energy Industry Identification System (EIIS) codes are identified in the text within brackets [ ].

I. DESCRIPTION OF EVENT

There were no structures, systems, or components that were inoperable at the start of the event which could have contributed to the event. The plant was operating in mode 1 at 100% power prior to receiving indications of increasing backpressure in the main condenser [SG]. At 2210 on 08/10/08, the Harris plant began reducing power and eventually shut down due to increasing backpressure in zone 2 of the main condenser and minor changes in secondary plant chemistry. At the time, conditions were indicative of a failure of the condenser exhaust boot seal [EXJ], manufactured by Flexonics, Incorporated. At 0520 on 08/08/08, while performing rounds the nightshift turbine building operator observed that there was no drain flow from the condenser zone 2 trough drain. Review of condenser performance trends at the time did not indicate an increase in condenser backpressure or decrease in plant performance. Following observation by Operations that the trough level had lowered, the trough supply valve was throttled open per round guidance to increase flow to the trough and restore full level. After approximately four hours, level was restored in the trough and flow was observed at the zone 2 drain line. The water loss from the trough reached the point where normal makeup could not maintain level and demineralized water was used to supplement the normal water source. At 1000 on 8/8/08, Engineering began development of a troubleshooting plan to identify the source of the observed conditions. At 2340 on 8/10/08, a decision was made to shut the unit down due to increasing condenser backpressure. At approximately 21% while reducing load, the unit was manually tripped due to reaching predetermined administrative limits. The plant promptly attained normal operation no-load temperature and pressure, and no unusual conditions or additional actuations were observed for plant equipment following the reactor and turbine trip. The main condenser exhaust boot seals were replaced and the unit was returned to service on 08/21/08 at 0958.

II. CAUSE OF EVENT

The root cause of this failure was that past experience was not applied to the preparation of the Preventative Maintenance Revision of a Single Point Vulnerability (SPV) critical component, specifically the main condenser exhaust boot. This resulted in the deferral of the scheduled main condenser exhaust boot PM replacement beyond its useful life.

Human Performance errors associated with this event were primarily due to the knowledge, mindset and assumptions of non-licensed utility Engineering personnel in making the decision to defer this exhaust boot maintenance item. The knowledge and assumption based errors were due primarily to the poor documentation of corrective actions from the past exhaust boot failures. Incorrect conclusions concerning life expectancy, clamp hardware design, and validity of inspections were reached based on face value of the historical documents available.

A fleet procedure is in place governing the PM deferral process, however the procedure does not provide guidance or cautions for SPVs, and the approval levels do not reflect the added risk associated with SPV component PM deferrals.

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NARRATIVE

III. SAFETY SIGNIFICANCE

This event is being reported pursuant to 10CFR50.73(a)(2)(iv)(A), An event or condition that resulted in manual actuation of the Reactor Protection System. The manual reactor trip at approximately 21% power is bounded by the analysis in Chapter 15 of the Final Safety Analysis Report (FSAR). The operating staff performed the required actions for the trip and there were no adverse safety consequences. The plant promptly attained normal operation no-load temperature and pressure and no unusual conditions, or additional actuations, were observed for plant equipment following the reactor trip and turbine trip.

Potential Safety Consequences:

This type of event is classified as an ANS Condition II event. The plant is designed for this type of event and responded as expected for the condition. The initial plant conditions were well within the bounding conditions for the plant design. The potential safety consequences under alternate conditions are also bounded by the FSAR Chapter 15 events.

IV. CORRECTIVE ACTIONS

The main condenser exhaust boot seals were replaced and the unit was returned to service on 08/21/08 at 0958. Planned corrective actions to prevent reoccurrence include revising the condenser exhaust boot seal replacement frequency based on operating experience and vendor recommendations. This replacement will include requirements to inspect and remove rough edges from mounting hardware and mating surfaces. All preventative maintenance deferrals prepared since June 2005 that deferred SPV outage maintenance items will be reviewed to ensure technical adequacy. Additionally, plant staff will revise the Nuclear Generation Group procedure governing Preventative Maintenance and Surveillance Testing Administration to provide guidance on Single Point Vulnerability deferrals and identify the appropriate approval levels.

V. PREVIOUS SIMILAR EVENTS

Two main condenser exhaust boot failures occurred in July of 1992. The cause of the failure in both cases was determined to be fatigue failure due to aging. These failures are detailed in LERs 92-007 and 92-010. A review of corrective actions developed from the exhaust boot failures in 1992 concludes that:

1. The actions were identified that would have prevented recurrence, if implemented.
2. The corrective action to establish a PM route/schedule for replacement did not result in a PM to periodically replace the boot seal.
3. The corrective action to complete the redesign of the hardware and the evaluation of the boot seal did not result in a hardware redesign or an evaluation of the seal.

The knowledge and assumption based errors were due primarily to the poor documentation of corrective actions from the past exhaust boot failures. Incorrect conclusions concerning life expectancy, clamp hardware design, and validity of inspections were reached based on face value of the historical documents available.